River beds on the move: Shifting flood risk?

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Credit: Michael B Singer

(Phys.org) —A detailed study of shifting river beds, conducted by researchers at the University of St Andrews, could hold the key to more accurate flood prevention.

Louise Slater, PhD Candidate, and Dr Michael Singer, Lecturer in the Department of Earth and Environmental Studies in the School of Geosciences at the University, studied alluvial river beds across the continental USA in the most in-depth study of its kind.

The results, published in the journal *Geology*, form the first systematic documentation of decadal trends in stream-bed elevation on continental scales.

They found evidence that the elevation of river beds is often not fixed over the long term, but has moved progressively higher or dropped lower over recent decades for most of the sites examined in the study.

The finding surprised the researchers.

Ms Slater said: "It is commonly believed that the elevation of river beds is more or less constant, so any change in flood risk is due to changes in hydrology.

"However, we found significant trends in the elevation of river beds at 70 per cent of sites studied across the continental USA - an indication that river channels are filling in with sediment or that sediment is being eroded through time."

Furthermore, the researchers found that these river bed elevation changes are larger in dry areas – a discovery they attributed to the fact dry climates produce run-off only during infrequent rainstorms and so are more effective at moving sediment and thus rapidly changing the river bed.

Ms Slater added: "If the riverbed elevation goes up, this could increase flood risk, while if bed elevation goes down, it would be reduced. Our findings of decadal trends in river bed elevation suggest that flood risk is more variable than previously thought, especially in dry regions, irrespective of climate change.

"The findings have important implications for the stability of riverine infrastructure, the navigability of rivers, the distribution of aquatic

habitat, flood management, and the flood insurance industry."

More information: geology.gsapubs.org/content/41/5/595.full

Provided by University of St Andrews